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Listing of the Claims

Please note the listing of the claims is as follows:

1. (currently amended) A method of removing an object from a digital image derived from digital image data, the method comprising:

displaying the digital image;

specifying a sub-region of the displayed digital image that contains at least a part of the object and another sub-region of the displayed digital image that does not contain the object;

identifying the object to be removed by categorizing the digital image data in the sub-region that contains at least a part of the object into an object region and a non-object region, wherein the object region and the non-object region are defined within a virtual frame that is visible over the digital image, and wherein the virtual frame has a central axis, and the object has a central axis;

rotating the virtual frame to align the central axis of the virtual frame with the central axis of the object, wherein the rotating operation defines a rotated virtual frame and includes sub-pixel sampling individual pixels in the virtual frame to define a corresponding new pixel within the rotated virtual frame;

modifying the digital image data of the object region to more closely resemble the digital image data of the non-object; and

combining noise into the modified digital image data of the object region.

2. (original) The method of claim 1 wherein the digital image data is provided in a format that describes a perceptual color space.

3. (original) The method of claim 2 wherein the perceptual color space is selected from perceptual color spaces having a lightness component.

4. (original) The method of claim 2 wherein the perceptual color space is selected from the group consisting of CIE L*u*v* and CIE L*a*b* color spaces.

5. (original) The method of claim 2 wherein the object is a defect.

6. (original) The method of claim 5 wherein the defect is digital data of a defect in an original image.

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7. (previously presented) The method of claim 1 wherein the noise is estimated from image data in a vicinity of the object.

8. (previously presented) The method of claim 7 wherein the noise is estimated by a process comprising sampling the digital image data from the digital image data in the sub-region that does not contain the object.

9. (previously presented) The method of claim 3 wherein the noise is estimated from digital image data in a vicinity of the object, and the noise is estimated by a process of sampling the digital image data from the digital image data in the sub-region that does not contain the object.

10. (previously presented) The method of claim 4 wherein the noise is estimated from digital image data in a vicinity of the object, and the noise is estimated by a process comprising sampling the digital image data from the digital image data in the sub-region that does not contain the object.

11. (original) The method of claim 9 wherein the perceptual color space is selected from the group consisting of the CIE L*a*b* color space and the CIE L*u*v* color space.

12. (original) The method of claim 1 wherein object regions and non-object regions are designated by application of a threshold value for at least one component of the digital image data for a pixel.

13. (original) The method of claim 1 wherein boundaries between object regions and non-object regions are determined by application of a threshold value for at least one component of the digital image data for a pixel.

14. (previously presented) The method of claim 1 wherein the modifying of the digital image data of the object region to more closely resemble the digital image data of the non-object region includes interpolation of non-defect data.

15. (previously presented) The method of claim 1 wherein the modifying of the digital image data of the object region to more closely resemble the digital image data of the non-object region includes linear interpolation of non-defect data and of original image data.

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16. (original) The method of claim 14 wherein the interpolation is linear interpolation.

17. (original) The method of claim 1 wherein the noise is random noise.

18. (previously presented) The method of claim 4 wherein the noise is sampled from non-object regions in a vicinity of the object.

19. (original) The method of claim 11 wherein boundaries between object regions and non-object regions are determined by application of a threshold value for at least one component of the digital image data for a pixel.

20. (previously presented) The method of claim 11 wherein the modifying of the digital image data of the object region to more closely resemble the digital image data of the non-object region includes interpolation of non-defect data.

21. (previously presented) The method of claim 11 wherein the modifying of the digital image data of the object region to more closely resemble the digital image data of the non-object region includes linear interpolation of non-defect data and of original image data.

22. (original) The method of claim 20 wherein the interpolation is linear interpolation.

23. (original) The method of claim 11 wherein the noise is random noise.

24. (original) A computer and software in the memory of the computer that can execute the process of claim 1.

25. (original) A computer and software in the memory of the computer that can execute the process of claim 4.

26. (original) A computer and software in the memory of the computer that can execute the process of claim 11.

27. (original) A computer and software in the memory of the computer that can execute the process of claim 19.

28. (previously presented) The method of claim 1 wherein the displaying operation comprises displaying the digital image to a user, and the specifying operation comprises

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receiving input from the user specifying a location of a virtual frame within the displayed digital image, the virtual frame defining the sub-region of the displayed digital image that contains the at least a part of the object and the sub-region of the displayed digital image that does not contain the object.

29. (currently amended) A computer program storage medium readable by a computer system and encoding a computer program for executing a computer process that removes an object from a digital image derived from digital image data, the computer process comprising:

displaying the digital image;

receiving specification of a sub-region of the displayed digital image that contains at least a part of the object and of another sub-region of the displayed digital image that does not contain the object;

identifying the object to be removed by categorizing the digital image data in the sub-region that contains at least a part of the object into an object region and a non-object region, wherein the object region and the non-object region are defined within a virtual frame that is visible over the digital image, and wherein the virtual frame has a central axis, and the object has a central axis;

rotating the virtual frame to align the central axis of the virtual frame with the central axis of the object, wherein the rotating operation defines a rotated virtual frame and includes sub-pixel sampling individual pixels in the virtual frame to define a corresponding new pixel within the rotated virtual frame;

modifying the digital image data of the object region to more closely resemble the digital image data of the non-object region;

combining noise into the modified digital image data of the object region.

30. (previously presented) The computer program product of claim 29 wherein the displaying operation comprises displaying the digital image to a user, and the specifying operation comprises receiving input from the user specifying a location of a virtual frame within the displayed digital image, the virtual frame defining the sub-region of the displayed digital image that contains the at least a part of the object and the sub-region of the displayed digital image that does not contain the object.

31. (currently amended) A method of correcting a defect from a digital image, the method comprising:

defining by user input a defect sub-region of the digital image that contains at least one pixel of the defect and at least one pixel not of the defect;

defining by user input a non-defect sub-region of the digital image that does not contain a pixel of the defect;

defining an array of interest in the digital image including one or more pixels in the defect sub-region and one or more pixels in the non-defect sub-region;

classifying one or more pixels along the array of interest in the defect sub-region as defect pixels, based on image data of pixels in the array of interest within the non-defect sub-region, wherein the defect sub-region and the non-defect sub-region are defined within a virtual frame that is visible over the digital image, and wherein the virtual frame has a central axis, and the defect has a central axis;

rotating the virtual frame to align the central axis of the virtual frame with the central axis of the defect, wherein the rotating operation defines a rotated virtual frame and includes sub-pixel sampling individual pixels in the virtual frame to define a corresponding new pixel within the rotated virtual frame;

modifying the classified defect pixels in the defect sub-region to correct the defect from the digital image; and

combining noise into one or more of the modified defect pixels of the defect sub-region.

32. (previously presented) The method of claim 31 wherein the defect sub-region is adjacent to the non-defect sub-region in the digital image.

33. (previously presented) The method of claim 31 wherein the array of interest is aligned with a column of pixels in the digital image.

34. (previously presented) The method of claim 31 wherein the array of interest is aligned with a row of pixels in the digital image.

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39. (currently amended) A computer program storage medium readable by a computer system and encoding a computer program for executing a computer process that corrects a defect in a digital image, the computer process comprising:

defining by user input a defect sub-region of the digital image that contains at least one pixel of the defect and at least one pixel not of the defect, and a non-defect sub-region of the digital image that does not contain a pixel of the defect;

defining an array of interest in the digital image including one or more pixels in the defect sub-region and one or more pixels in the non-defect sub-region;

classifying along the array of interest one or more pixels in the defect sub-region as defect pixels, based on image data of pixels in the array of interest within the non-defect sub-region, wherein the defect sub-region and the non-defect sub-region are defined within a virtual frame that is visible over the digital image, and wherein the virtual frame has a central axis, and the defect has a central axis;

rotating the virtual frame to align the central axis of the virtual frame with the central axis of the defect, wherein the rotating operation defines a rotated virtual frame and includes sub-pixel sampling individual pixels in the virtual frame to define a corresponding new pixel within the rotated virtual frame;

modifying the classified defect pixels in the defect sub-region to correct the defect from the digital image; and

combining noise into one or more of the modified defect pixels of the defect sub-region.

40. (previously presented) The computer program product of claim 39 wherein the defect sub-region is adjacent to the non-defect sub-region in the digital image.

41. (previously presented) The computer program product of claim 39 wherein the array of interest is aligned with a column of pixels in the digital image.

42. (previously presented) The computer program product of claim 39 wherein the array of interest is aligned with a row of pixels in the digital image.

43 – 46 (canceled)